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# PATENT SPECIFICATION



Application Date: Apr. 22, 1922. No. 11,357/22.

185,709

Complete Left: Aug. 5, 1922.

Complete Accepted: Sept. 14, 1922.

## PROVISIONAL SPECIFICATION.

### Improvements in Driving Mechanism for Mechanically Operated Lifts.

We, ETCHELLS, CONGDON AND MUIR LIMITED, of Mill Street, Ancoats, City of Manchester, Engineers, a British company, and FRANCIS MUIR, Managing Director with the said Company, a British subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to mechanism for driving a lift direct from a gas engine or other continuously running source of power, without the use or intervention of driving belts.

According to the invention an extension is coupled to the engine shaft, mounted in convenient bearings and carrying a toothed pinion and a sprocket chain wheel. These rotate continuously during the time the lift is required for use. A clutch shaft is mounted adjacent thereto in axial alignment with the worm shaft of the lift which is of standard or ordinary construction. On the clutch shaft two friction clutches (which may be of disc or cone type) are mounted one member of each being keyed fast to the shaft and the other member of each loose and free to rotate thereon. The free members of the clutches are provided the one with a toothed pinion wheel to mesh with pinion on the engine shaft extension and the other with a chain sprocket wheel geared by a chain with that on the other shaft thus the two loose clutch members rotate continuously in opposite directions. The clutch shaft is coupled

to the worm shaft by a sliding coupling which may be mounted on ball bearings within an extension of the brake drum. A ball thrust washer is fitted behind each of the revolving loose clutch members and by sliding the clutch shaft in one direction or the other one clutch or the other is brought into operation as required, to raise or lower the lift. At one end of the clutch shaft an operating lever is pivoted by which the shaft is moved longitudinally. The free end of this lever is affixed to a sliding rod connected by a connecting rod with a crank on the shaft of a hand rope controlling pulley. A centreing spring is placed to maintain the clutch lever in its central position and the clutch members out of contact by pulling the hand rope and rotating the control pulley in one direction or the other one of the clutches is thrown into operation and the lift raised or lowered. A brake is automatically applied by spring or weight to the brake drum on the worm shaft the brake lever being connected by a link with the crank of the control pulley by which the brake is released as the pulley is moved in either direction from its central position.

Dated this 6th day of April, 1922.

J. OWDEN O'BRIEN,  
Late W. P. Thompson & Co., of  
Manchester,  
Patent Agent.

[Price 1/-]

## Improvements in Driving Mechanism for Mechanically Operated Lifts.

We, ETCHells, CONGDON AND MURN LIMITED, of Mill Street, Ancoats, City of Manchester, Engineers, a British company, and FRANCIS MURN, Managing Director with the said Company, a British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to mechanism for driving a lift direct from a gas engine or other continuously running source of power, without the use or intervention of driving belts, and without changing the direction of rotation of the motor shaft.

The invention is in the particular mechanism hereinafter shown and described interposed between the gas engine or other motor and the worm gear of the lift, by which the lift can be reversed without changing the direction of motion of the engine or motor.

It will be fully described with reference to the accompanying drawings.

Fig. 1 front elevation, on line X—X Fig. 2.

Fig. 2 plan.

Fig. 3 longitudinal section through the clutches F & G.

Fig. 4 transverse sectional elevation through the brake M.

The gas engine A (or the continuous motor) is of any known construction with a continuously rotating shaft *a* and fly-wheel A<sup>1</sup> and the worm gear B, by which the lift is operated through a drum or pulley B<sup>1</sup> on the shaft *b* is also of known and ordinary construction.

In carrying out the invention an extension shaft C mounted in convenient bearings *c* is coupled to the engine shaft *a*, and a toothed pinion D and a sprocket chain wheel D<sup>1</sup> are keyed or otherwise affixed to it. The shaft C, the pinion D and the sprocket wheel D<sup>1</sup> rotate continuously with the motor A in one direction during the time the lift is required for use. A clutch shaft E is mounted adjacent to the extension shaft C, and in axial alignment with the worm shaft b<sup>1</sup> of the lift. On the clutch shaft E two friction clutches F and G (which may be of disc or cone type) are mounted, the member *f* of the clutch F and the mem-

ber *g* of the clutch G being keyed fast to the shaft E and the other members *f*<sup>1</sup> and *g*<sup>1</sup> of each clutch loose and free to rotate thereon. The free member *f*<sup>1</sup> of the clutch F is provided with a toothed pinion wheel *d* to mesh with pinion D on the extension shaft C, and the free member *g*<sup>1</sup> of the clutch G with a chain sprocket wheel *d*<sup>1</sup> geared by a chain *d*<sup>2</sup> with the sprocket D<sup>1</sup> on the extension shaft C thus the two loose clutch members *f*<sup>1</sup> and *g*<sup>1</sup> rotate continuously on the shaft C in opposite directions. A ball thrust washer H is fitted behind each of the revolving loose clutch members.

The clutch shaft E is coupled to the worm shaft b<sup>1</sup> by a sliding coupling K of any ordinary or suitable design. It is shown formed of two members *k* and *k*<sup>1</sup> the member *k* formed with internal grooves and the member *k*<sup>1</sup> with external grooves into which balls *k*<sup>2</sup> are fitted which while ensuring rotary motion being conveyed from the shaft E to the shaft b<sup>1</sup>, allow longitudinal movement of the shaft E without any such movement of the shaft b<sup>1</sup>. The member *k* of the coupling K is preferably attached to or forms part of a brake drum M secured to the shaft b<sup>1</sup> though the coupling K may be secured to the shaft b<sup>1</sup> independently of the brake drum.

At one end of the clutch shaft E an operating lever N is pivoted by which the shaft E is moved longitudinally, and by sliding the clutch shaft in one direction or the other one clutch or the other is brought into operation as required to rotate the shaft in the direction to raise or lower the lift.

The free end of the lever N is affixed to a sliding rod *n* connected by a connecting rod *n*<sup>1</sup> with a crank *p* on the shaft of a hand rope controlling pulley P. A centreing spring *n*<sup>2</sup> is placed on the rod *n* to maintain the clutch lever N in its central position and the clutch members out of contact. By pulling the hand rope (not shown) and rotating the control pulley P in one direction or the other one of the clutches F or G is thrown into operation and the shaft E rotated and the lift raised or lowered.

It will be obvious that instead of moving the clutch shaft E longitudinally the two clutch members *f* and *g* may be

made to slide on keys or splines on the shaft E and the clutch lever N be placed between them.

A brake M is fitted on the worm shaft 5 b', the straps or shoes m of which are applied automatically to the drum M by the spring m' or by a weight. The lever R by which the brake is released or taken off is connected by a pin r with 10 the crank p of the rope control pulley P, so that the movement of the pulley P from its central position to start the lift in either direction simultaneously releases the brake and when the pulley 15 returns to its central position the brake is immediately applied by the spring m' to stop the lift.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to 20 be performed, we declare that what we claim is:—

1. The mechanism for driving a lift from a shaft continuously rotating in

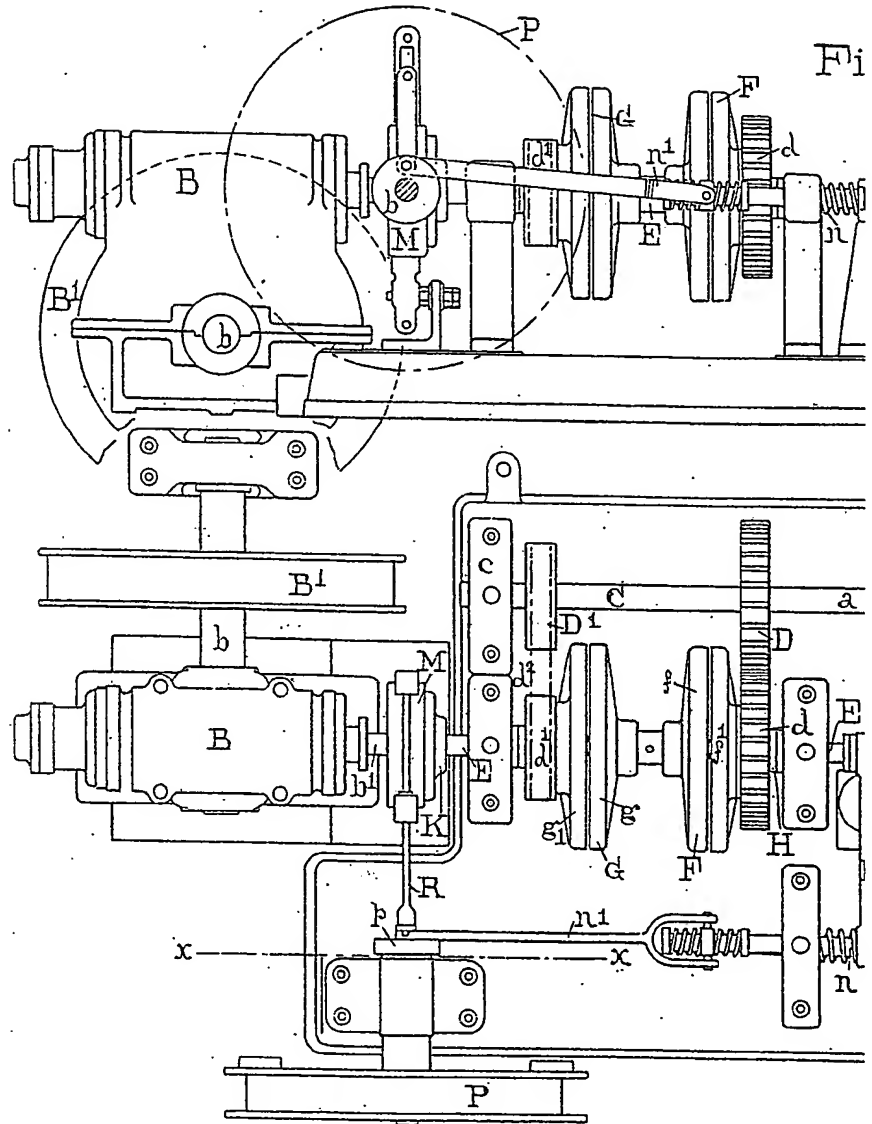
one direction comprising an extension of 25 the power shaft, a pinion and chain sprocket wheel thereon, a clutch shaft coupled to the worm gear of the lift with clutch members keyed fast thereto, a loose clutch member and pinion thereon 30 in mesh with the pinion on the extension shaft, a loose clutch member and sprocket thereon geared by chain with the sprocket on the extension shaft, so that the loose clutch members are continuously rotat- 35 ing in opposite directions, and means connected with the rope control pulley of the lift for throwing one fast clutch member or the other in contact with the loose rotating clutch members substan- 40 tially as described.

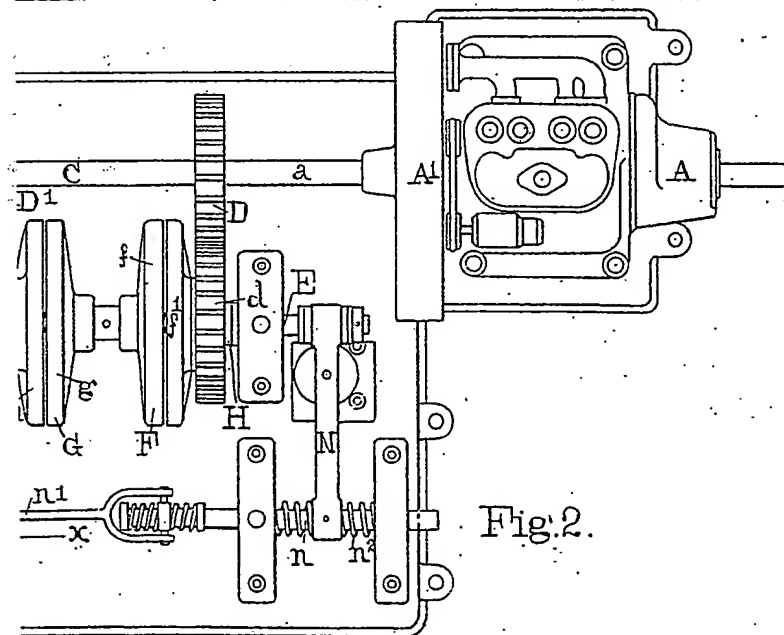
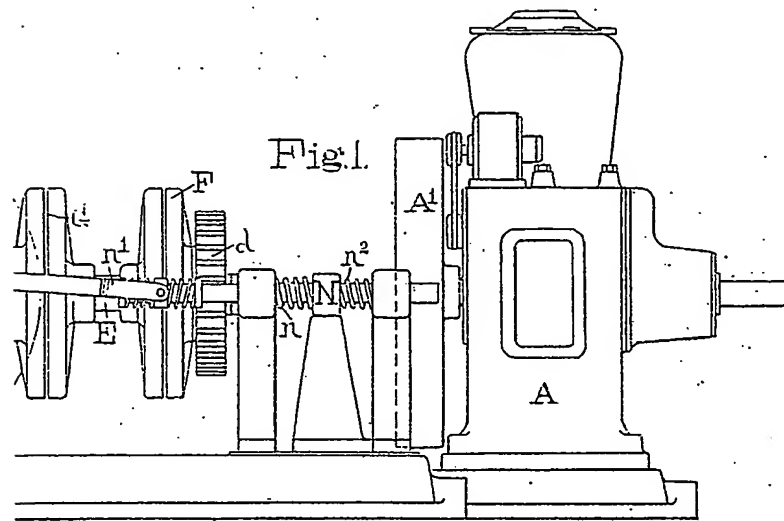
2. Mechanism for driving a lift substantially as described and shown.

Dated this 22nd day of July, 1922.

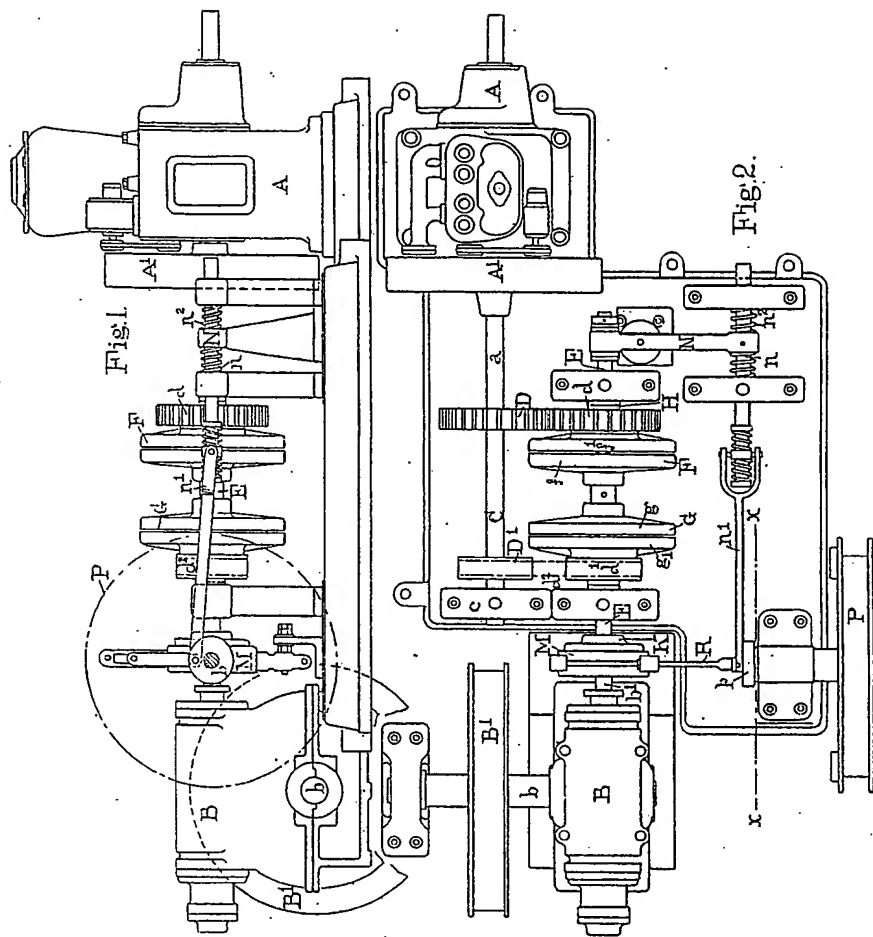
J. OWDEN O'BRIEN, 45  
Late W. P. Thompson & Co., of  
Manchester,  
Patent Agent.

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185,709 COMPLETE SPECIFICATION



*[This Drawing is a reproduction of the Original on a reduced scale.]*

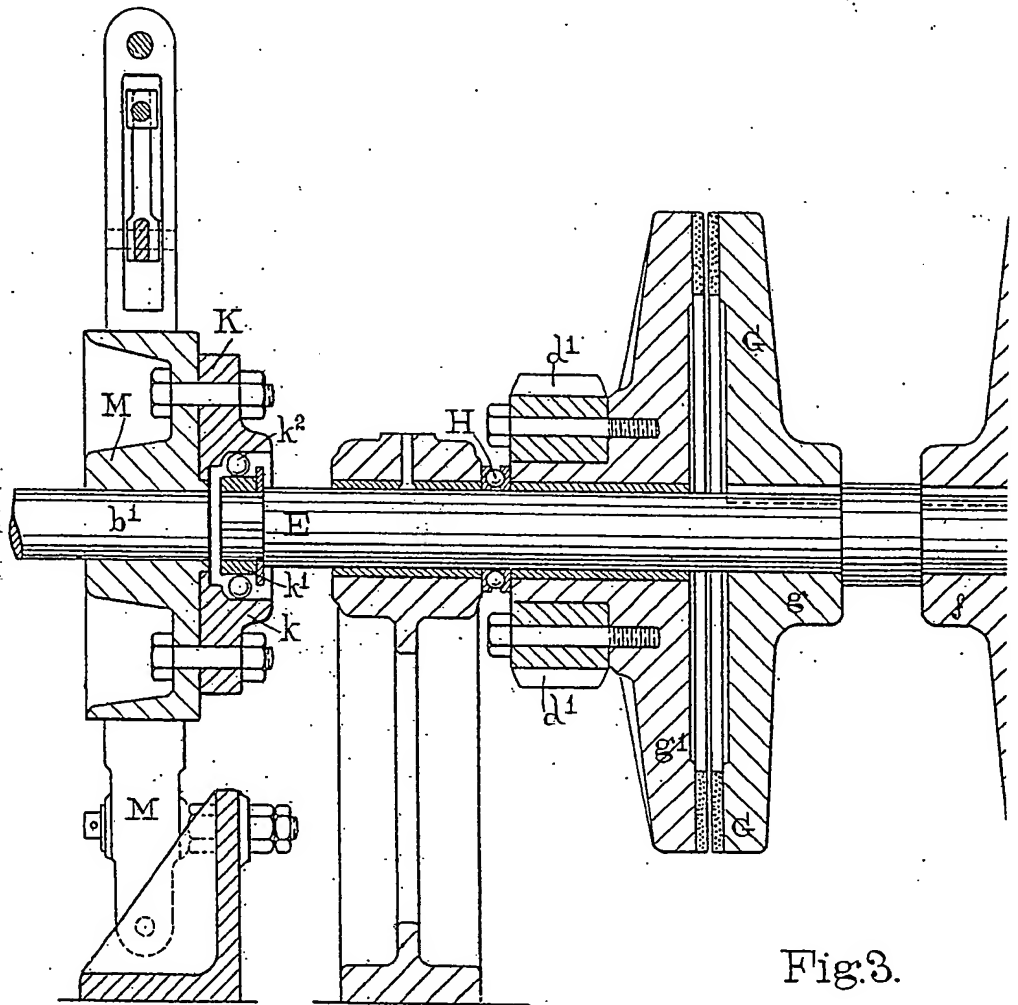


Fig. 3.

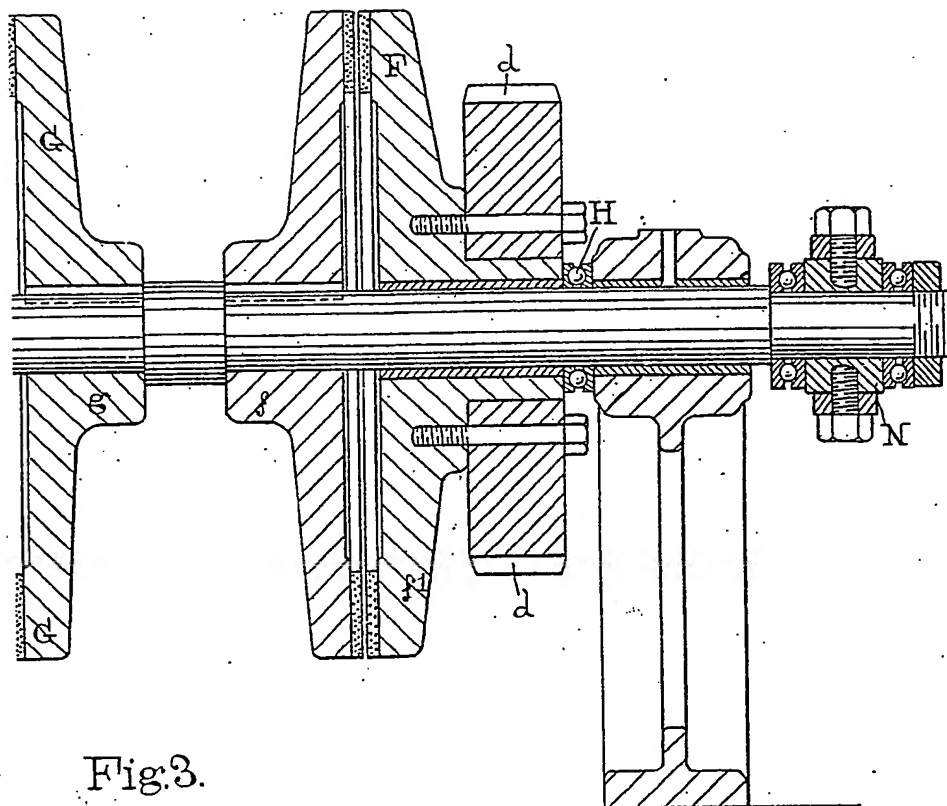
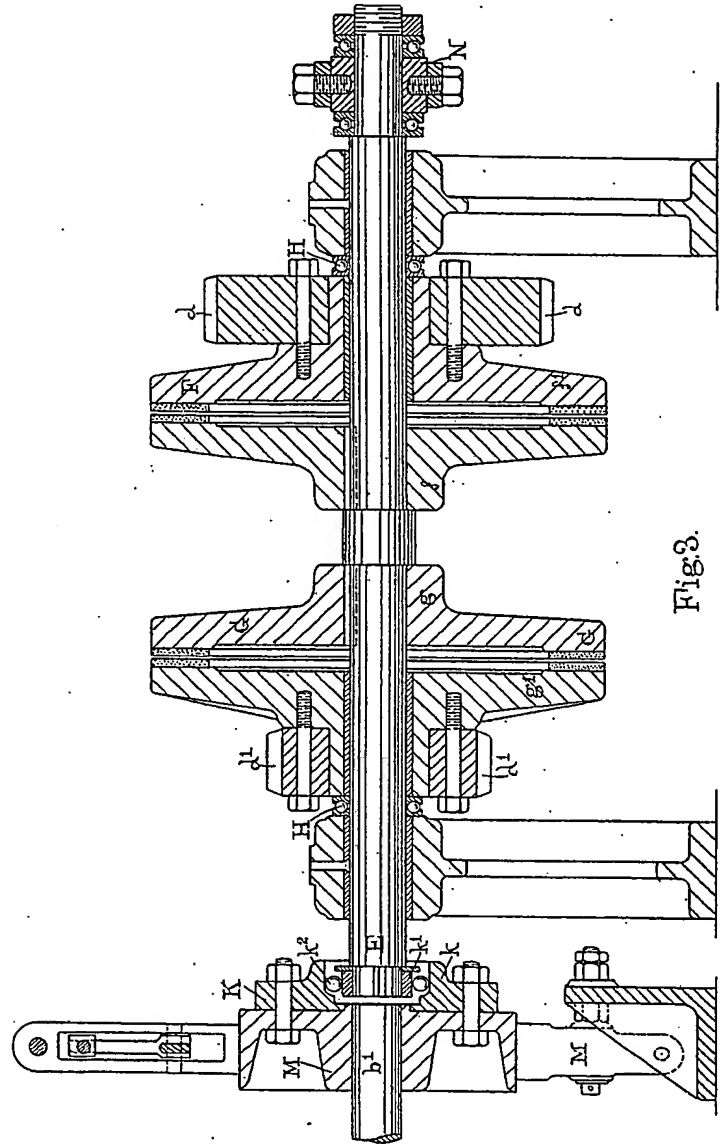


Fig. 3.

Malby & Sons, Photo-Litho.





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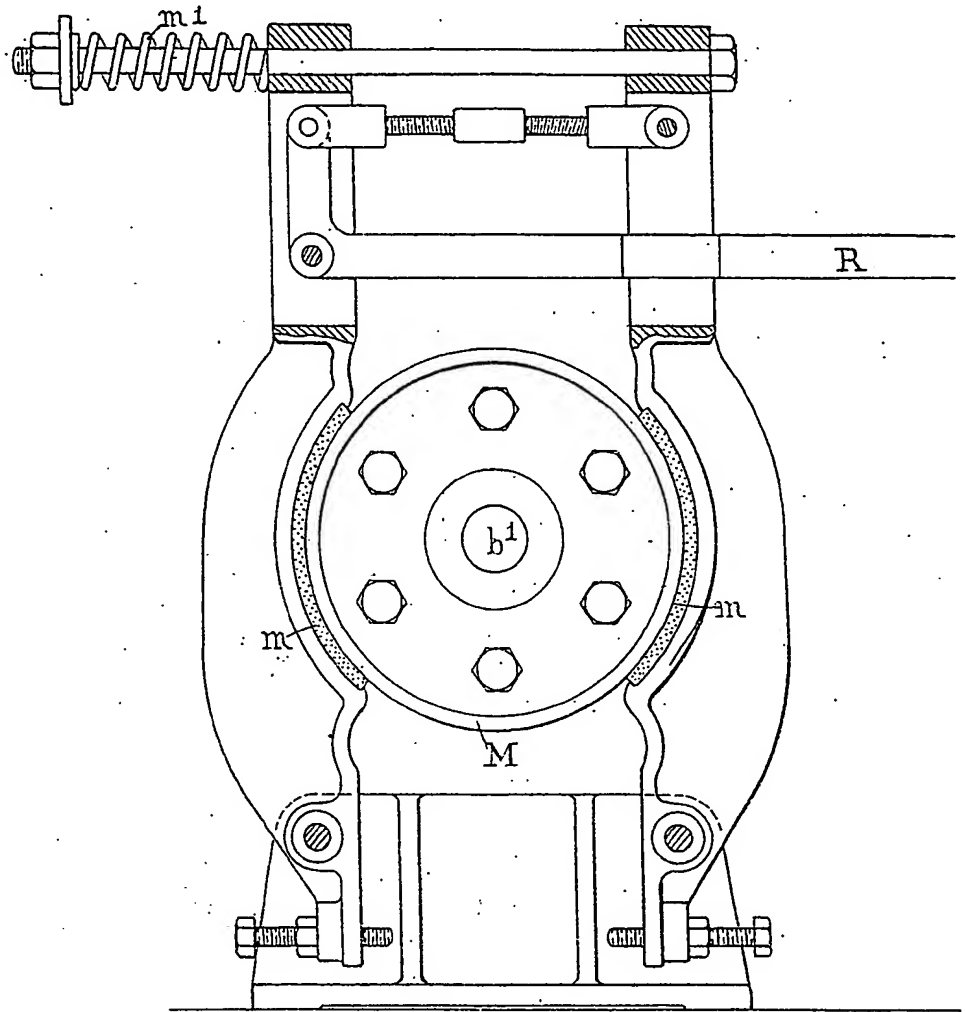


Fig. 4.

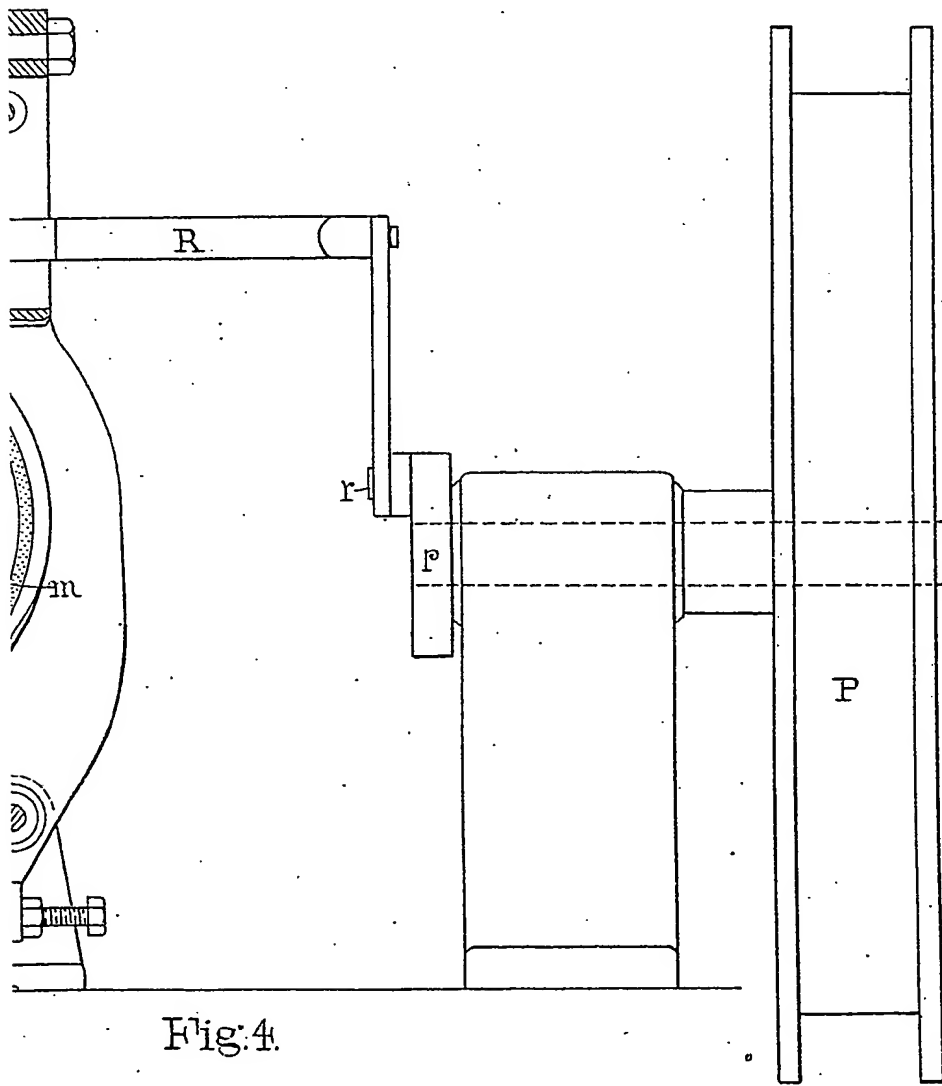
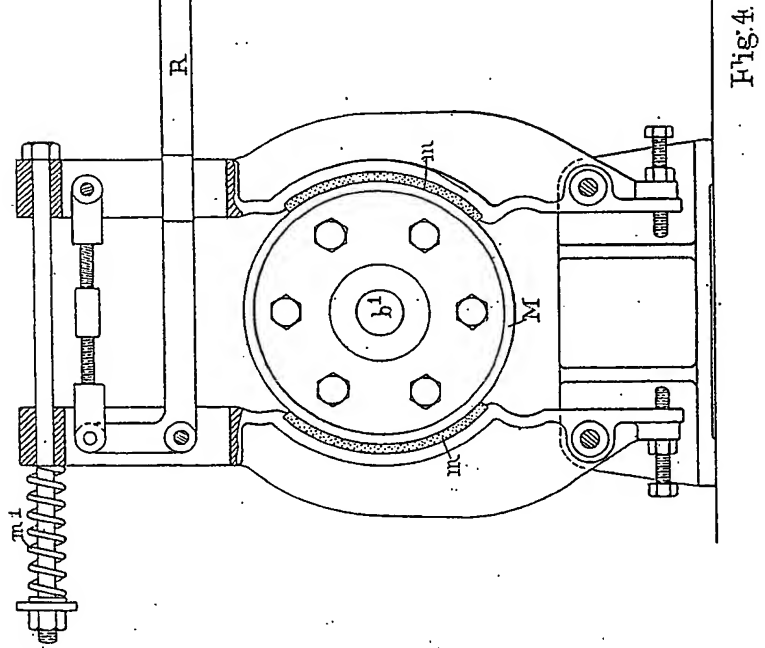


Fig. 4.



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